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EFFLUENT LIMITATIONS GUIDELINES FOR EXISTING SOURCES AND STANDARDS OF PERFORMANCE AND PRETREATMENT STANDARDS FOR NEW SOURCES

Notice of Proposed Rulemaking

ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 411]

CEMENT MANUFACTURING POINT SOURCE CATEGORY

Effluent Limitations Guidelines for Existing Sources and Standards of Performance and Pretreatment Standards for New Sources

Notice is hereby given that effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources set forth in tentative form below are proposed by the Environmental Protection Agency (EPA) for the cement manufacturing category of point sources pursuant to sections 301, 304 (b) and (c), 306(b) and 307(c) of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316(b) and 1317(c); 86 Stat. 816 et seq.; P.L. 92-500) (the "Act").

(a) Legal authority:

(1) Existing point sources:

Section 301(b) of the act requires the achievement by not later than July 1, 1977, of effluent limitations for point sources, other than publicly owned treatment works, which require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 304(b) of the Act. Section 301(b) also requires the achievement by not later than July 1, 1983, of effluent limitations for point sources, other than publicly owned treatment works, which require the application of best available technology economically achievable which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 304(b) to the Act.

Section 304(b) of the Act requires the Administrator to publish regulations providing guidelines for effluent limitations setting forth the degree of effluent reduction attainable through the application of the best practicable control technology currently available and the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods and other alternatives. The regulations proposed herein set forth effluent limitations guidelines, pursuant to section 304(b) of the Act, for the cement manufacturing category.

(2) New sources:

Section 306 of the Act requires the achievement by new sources of a Federal standard of performance providing for the control of the discharge of pollutants which reflects the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

Section 306(b)(1)(B) of the Act requires the Administrator to propose regulations establishing Federal standards of performance for categories of new sources included in a list published pursuant to section 306(b)(1)(A) of the Act. The Administrator published in the FEDERAL REGISTER of January 16, 1973, (38 FR 1624) a list of 27 source categories including the cement manufacturing category. The regulations proposed herein set forth the standards of performance applicable to new sources within the cement manufacturing category.

Section 307(c) of the Act requires the Administrator to promulgate pretreatment standards for new sources at the same time that standards of performance for new sources are promulgated pursuant to section 306. Sections 411.15 and 411.25 proposed below provides pretreatment standards for new sources within the cement manufacturing category.

Section 304(c) of the Act requires the Administrator to issue to the States and appropriate water pollution control agencies information on the processes, procedures or operating methods which result in the elimination or reduction of the discharge of pollutants to implement standards of performance under Section 306 of the Act. The development document described further below in section (b)(2) of this preamble provides, pursuant to section 304(c) of the Act, preliminary information on such processes, procedures or operating methods.

(3) Thermal Discharges section 316 (a) of the Act provides a means for further consideration of thermal effluent limitations required under sections 301 and 306 of the Act. Section 316(a) states that with respect to any point source subject to the provisions of sections 301 or 306, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose a different effluent limitation for the thermal component of the discharge than would ordinarily be required under sections 301 and 306 of the Act. Effluent limitations imposed under section 316(a) must assure the protection and propagation of a balanced indigenous population of shellfish, and wildlife in and on the body of water into which the discharge is to be made.

(b) Summary and basis of proposed effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources.

(1) *General methodology.*—The effluent limitations guidelines and standards of performance proposed herein were developed in the following manner. The point source category was first studied for the purpose of determining whether separate limitations and standards are appropriate for different segments within the category. This analysis included a determination of whether differences in raw material used, product produced, manufacturing process employed, age, size, waste water constituents and other factors require development of separate limitations and standards for different segments of the point source category. The raw waste characteristics for each such segment were then identified. This included an analysis of: (1) the source, flow and volume of water used in the process employed and the sources of waste and waste waters in the plant; and (2) the constituents of all waste water. The constituents of the waste waters which should be subject to effluent limitations guidelines and standards of performance were identified.

Next, the control and treatment technologies existing within each segment were identified. This included an identification of each distinct control and treatment technology, including both in-plant and end-of-process technologies, which are existent or capable of being designed for each segment. It also included an identification of, in terms of the amount of constituents and the chemical, physical, and biological characteristics of pollutants, the effluent level resulting from the application of each of the technologies. The problems, limitations and reliability of each treatment and control technology were also identified. In addition, the non-water quality environmental impact, such as the effects of the application of such technologies upon other pollution problems, including air, solid waste, noise and radiation were identified. The energy requirements of each control and treatment technology were determined as well as the cost of the application of such technologies.

The information, as outlined above, was then evaluated in order to determine what levels of technology constitute the "best practicable control technology currently available," "best available technology economically achievable" and the "best available demonstrated control technology, processes, operating methods, or other alternatives." In identifying such technologies, various factors were considered. These included the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements) and other factors.

The data upon which the above analysis was performed included Refuse Act Permit Applications, EPA sampling and inspections, consultant reports, and industry submissions.

The pretreatment standards proposed herein are intended to be complementary

to the pretreatment standards proposed for existing sources under Part 128 of 40 CFR. The basis for such standards is set forth in the FEDERAL REGISTER of July 19, 1973, 38 FR 19236. The provisions of Part 128 are equally applicable to sources which would constitute "new sources" under section 306 if they were to discharge pollutants directly to navigable waters, except for § 128.133. That section provides a pretreatment standard for "incompatible pollutants" which requires application of the "best practicable control technology currently available," subject to an adjustment for amounts of pollutants removed by the publicly owned treatment works. Since the pretreatment standards proposed herein apply to new sources, §§ 411.15 and 411.25 below amend § 128.133 to require application of the standard of performance for new sources rather than the "best practicable" standard applicable to existing sources under sections 301 and 304(b) of the Act.

(2) *Summary of conclusions with respect to cement manufacturing category.*—General information was obtained on all plants and detailed information was collected for 132 (80 percent) of the 166 domestic cement plants identified as currently in operation. The sources and type of information consisted of: (1) Applications to the Army Corps of Engineers for Permits to Discharge under the Refuse Act Permit Program (RAPP) were obtained for 88 plants and provided data on the characteristics of intake and effluent waters, water usage (including flow diagrams in many cases), waste water treatment and control practices employed, daily production, and raw materials used; (2) a questionnaire to nine companies covering 64 plants (including 35 plants for which RAPP applications were not available) provided data on raw material analysis, dust collection and disposal methods, alkali content of the dust, plant age and year of latest modification, detailed water usage, fuels, and treatment and control methods and costs; (3) on-site inspections of 15 plants provided flow diagrams, detailed information on water management practices, and control and treatment methods, equipment, and costs; and (4) other sources of information included EPA technical reports, trade literature, personal and telephone interviews and meetings with regional EPA personnel, industry personnel, and consultants.

This information was compiled by data processing techniques and analyzed for the following: (1) identification of distinguishing features that could potentially provide a basis for subcategorization of the industry (*e.g.*, method of dust collection and disposal, type of process, raw materials, and plant size and age); (2) determination of the water usage and waste characteristics for each of the subcategories including the volume of water used, the sources of contamination in the plant, and the type and quantity of constituents in the waste waters; and (3) identification and determination of those waste water constituents which are characteristic of the industry and subject to effluent limitations guidelines and standards.

The cement manufacturing industry was segmented into two subcategories based upon the method for kiln dust collection and disposition and resulting waste water characteristics. The subcategories are: leaching plants and nonleaching plants. The scope of these subcategories is defined in §§ 411.10 and 411.20 below. The leaching category includes plants in which water comes into contact with kiln dust as an integral part of the process or in which wet scrubbing of kiln stack emissions is employed. Raw waste water loads and necessary treatment methods and technology are substantially different for plants in the leaching subcategory. Factors such as age, size of plant, raw materials, fuel used, process employed, waste water constituents, waste control technologies, and plant location further substantiated the subcategorization of the cement manufacturing industry in this manner for the purpose of the application of effluent limitations guidelines and standards of performance. The pollutants contained in raw waste water resulting from cement manufacturing are principally dissolved solids (potassium and sodium hydroxide, chlorides and sulfates), suspended solids (calcium carbonate) and waste heat.

There are relatively few operations in cement manufacturing where the addition of pollutants to the water used is inherently associated with the use of that water. For nonleaching plants, pollution generally results from practices that allow materials to come in contact with the water. Pollutant levels at these plants can be greatly reduced or eliminated by suitable in-plant control measures that prevent wastes from entering the water or by more extensive reuse and recycling of water that may become contaminated.

For the plants in the leaching subcategory, wastes are necessarily introduced into the water and recycling is not feasible. Thus, for these plants, treatment is required to reduce the pollutant loading.

The main control and treatment methods for the cement industry involve recycle and reuse of wastewater. The devices employed include cooling towers or ponds, settling ponds, containment ponds, and clarifiers. Cooling towers or ponds are used to reduce the temperature of waters used to cool process equipment. Settling ponds are used primarily to reduce the concentration of suspended solids. Containment ponds are used to dispose of waste kiln dust in the nonleaching plants. Clarifiers are mainly used to separate solids in dust-leaching plants. With the exception of plants in the leaching subcategory, most cement plants can achieve virtually complete reuse of wastewater with existing state-of-art technology.

Five alternative control and treatment technologies and the attendant costs have been identified for the cement manufacturing category: two for the nonleaching subcategory and three for the leaching subcategory.

The first alternative for the nonleaching subcategory involves recycling and reuse of all water used in manufacturing and containment or treatment of runoff from kiln-dust piles.

This alternative will result in essentially no discharge of pollutants. The investment cost of implementing this technology at a typical plant will be about $200,000 including a cooling tower ($94,000) or spray pond ($91,000), the necessary piping ($76,000), and containment dikes for kiln-dust piles ($35,000). If an evaporative cooling pond is used, it would cost about $160,000 including piping, but not including land cost.

The operating costs of this alternative will range from about $20,000 to $30,000 per year including maintenance, sludge removal, chemicals, labor cost of power, and taxes and insurance. Power costs are limited to pumping and amount to $13,000 per year.

The second alternative involves limited water reuse and in-plant controls.

This alternative consists of isolation of cooling streams from possible contamination, reuse of cooling water in feed slurry (wet-process plants), retention and reuse or treatment of miscellaneous wastewater (e.g. truck washing) and containment or treatment of runoff from dust piles and would also result in no discharge of pollutants in manufacturing effluents.

Cost of implementing this alternative will vary somewhat within the industry but on the average will be comparable to that for the first alternative.

The first alternative for leaching plants involves the segregation and treatment of the leachate stream.

The nonleaching streams of leaching plants are treated like those of nonleaching plants under this alternative. Treatment of the leachate stream consists of neutralization of the leachate with stack gases, followed by secondary sedimentation to remove both the residual suspended solids that were present in the leachate and the suspended solids (calcium carbonate) created by the neutralization with carbon dioxide.

This alternative will result in an acceptable pH of 9.0, and a suspended solids level of not more than 0.15 kg/kkg (0.30 lb/ton) of dust leached. Dissolved solids will remain at about their present level.

The cost of implementing this alternative will be about $425,000 including $165,000 for the control of nonleaching streams and the cost of installing a stack-gas neutralization system and a clarifier ($260,000). Operating costs will range from about $35,000 to $45,000 per year.

Implementation of this alternative will result in essentially no discharge of pollutants.

The third alternative for the leaching subcategory would be the abandonment of existing leaching operations.

Under this alternative, plants that presently each kiln dust would abandon the practice and adopt either the first or second alternative for nonleaching plants which will result in essentially no discharge of pollutant. The cost of dust

disposal is estimated to be $0.50 per ton (including hauling and piling costs). The value of wasted dust would be about $2.00 per ton (based upon cost to formulate and grind an equivalent amount of raw ingredients). Therefore, the annual cost of wasting 200 tons per day of dust that is presently leached would be $165,000.

Non-water quality environmental impacts due to the effects of the control and treatment technologies described are minimal. Some additional solid wastes will be generated by increased use of sedimentation, but the amount will be quite small compared to the larger quantity of kiln dust normally wasted. The much increased cost of dust leaching may discourage its practice at some plants and thereby add to the solid waste load and create localized dust problems on windy days. However, there are techniques available such as latex coating or water spraying to reduce this problem.

Because of the large energy requirement at a cement plant, about 1.25 million kg cal (5 million BTU) in fuel and about 120 kwhr of electric power per metric ton, the added power needed to operate the recycling systems is small (estimated to be less than 5.0 percent of the total energy requirements) in relation to the total energy requirements of a plant.

The cement manufacturing industry is successfully practicing recycling and waste water reuse at a significant number of non-leaching plants (using the first and second alternative described above). EPA has concluded that the effluent quality representing the degree of effluent reduction obtainable through the application of the best practicable control technology currently available for plants in the non-leaching subcategory is essentially no discharge of waste waters to navigable water as defined in § 411.12 below.

For plants in the leaching subcategory, EPA has concluded that the best practicable control technology currently available is neutralization to reduce alkalinity and chemical treatment and sedimentation to reduce suspended solids (the first alternative described above). The degree of effluent reduction attainable through application of best practicable control technology currently available is set forth in § 411.12 below.

A report entitled "Development Document for Proposed Effluent Limitations Guidelines and New Source Performance Standards of the Cement Manufacturing Industry Point Source Category" which details the analysis undertaken in support of the regulations being proposed herein is available for inspection at the EPA Information Center, Room 227, West Tower, Waterside Mall in Washington, D.C., at all EPA regional offices, and at State water pollution offices. A supplementary analysis of the possible economic effect of the proposed regulations is also available for inspection at these locations. Copies of both of these documents are being sent to persons or institutions affected by the proposed regulations, or who have placed themselves on a mailing list for this purpose (see EPA's Advance Notice of Public Review Procedures, 38 FR 21202, August 6, 1973). An additional limited number of copies of both reports are available. Persons wishing to obtain a copy may write the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Philip B. Wisman.

(c) Summary of public participation: Prior to this publication, the agencies and groups listed below were consulted with respect to the development of the effluent limitations guidelines and standards of performance for the cement manufacturing industry category: (a) Effluent Standards and Water Quality Information Advisory Committee (established under section 515 of the Act); (b) all interested State and U.S. Territory Pollution Control Agencies; (c) Ohio River Valley Sanitation Commission; (d) New England Interstate Water Pollution Control Commission; (e) Delaware River Basin Commission; (f) Hudson River Sloop Restoration, Inc.; (g) Conservation Foundation; (h) Portland Cement Association; (i) Environmental Defense Fund, Inc.; (j) Natural Resources Defense Council; (k) The American Society of Civil Engineers; (l) Water Pollution Control Federation; (m) National Wildlife Federation; (n) The American Society of Mechanical Engineers; (o) U.S. Department of Commerce; (p) Water Resources Council; and (q) the U.S. Department of the Interior.

The primary issues raised in the development of these proposed effluent limitations guidelines and standards of performance and the treatment of these issued herein are as follows: (1) Industry was concerned that the standards for suspended solids would exceed the capability of the treatment systems following leaching to reduce suspended solids. To determine the degree to which the standard for leaching plants would affect the treatability of suspended solids, values of: 120,000 gallons per day flow in the leaching stream; 208 tons per day of dust leached; and a dust/water ratio of 0.416 was used to calculate a concentration of 44 ppm. Using the same dust/water ratio and flow values and the mass value of 0.30 lb/ton of dust leached, a concentration of 62.5 ppm was established. Both the 44 ppm and the 62.5 ppm values are well above the minimal concentration values to obtain effective suspended solids removal in a properly designed treatment system. (2) Industry was concerned that dikes and containment basins might not be able to prevent runoff from kiln dust and materials storage piles during hurricanes and unusual storm conditions. It is the agency's intention that the dikes and containment ponds should be designed for a 10 year, 24 hour rainfall event. (3) One company in the industry objected to the standard of essentially no discharge on the basis that this would entail a burdensome cost for pumping recycling water. At least 20 percent of the plants in the industry are currently achieving the essentially no discharge standard. (4) The Natural Resources Defense Council questioned the rationale for excluding iron and aluminum as pollutants. The agency's data shows that iron and aluminum are present, if at all, in negligible amounts (0.000 to 0.001 lb/ton of product produced). (5) The Natural Resources Defense Council suggested that the Patzias process for potassium recovery be studied further for possible application in industry to recover potassium as a by-product of kiln dust. The updated costs (from 1957 to 1971) indicate a recovery cost of about $93/ton; the market price of potassium from other commercial sources at present is between $30 and $50/ton. (6) The Natural Resources Defense Council also was concerned that electrodialysis technology might be available for 1977 rather than for 1983 as the agency recommends. The agency's best engineering judgment indicated that electrodialysis technology can be adapted to fill the requirements of leachate demineralization and recycle; but, the operating parameters will have to be thoroughly outlined so that the plants in question can decide which course to pursue. A development program is likely to take more than a year thus, reducing lead time for selection and installation of equipment. In addition, the 1983 deadline provides the time necessary to evaluate other treatment methods that are being used or developed for related problems in other industries. (7) Industry requested that plants that use wet dust disposal should be grouped with leaching plants instead of with non-leaching plants. The agency's best judgement is that alternative material transfer methods, air conveying or hauling, are available to the manufacturer which do not pose as great a threat for pollutant discharge as wet disposal methods. Since the manufacturer has the option of an alternative method, plants currently using wet disposal systems should be grouped in the nonleaching subcategory.

Interested persons may participate in this rulemaking by submitting written comments in triplicate to the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460. Attention: Mr. Philip B. Wisman. Comments on all aspects of the proposed regulations are solicited. All comments received on or before October 9, 1973, will be considered.

Dated: August 31, 1973.

JOHN QUARLES,
Acting Administrator.

PART 41—EFFLUENT LIMITATIONS GUIDELINES FOR EXISTING SOURCES AND STANDARDS OF PERFORMANCE AND PRETREATMENT STANDARDS FOR NEW SOURCES FOR THE CEMENT MANUFACTURING CATEGORY OF POINT SOURCES

Subpart A—Nonleaching Subcategory

Sec.

411.10 Applicability; description of nonleaching subcategory.
411.11 Specialized definitions.

411.12 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.
411.13 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.
411.14 Standards of performance for new sources.
411.15 Pretreatment standards for new sources.

Subpart B—Leaching Subcategory

411.20 Applicability; description of leaching subcategory.
411.21 Specialized definitions.
411.22 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.
411.23 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.
411.24 Standards of performance for new sources.
411.25 Pretreatment standards for new sources.

Subpart A—Nonleaching Subcategory

§ 411.10 Applicability; description of nonleaching subcategory.

The provisions of this subpart are applicable to discharges resulting from the process in which several mineral ingredients (limestone or other natural sources of calcium carbonate, silica, alumina, and iron together with gypsum) are used in the manufacturing of cement and in which kiln dust is not contacted with water as an integral part of the process and water is not used in wet scrubbers to control kiln stack emissions.

§ 411.11 Specialized definitions.

For the purpose of this subpart: The following definitions apply in addition to, or instead of the general definitions set forth in Part 401, 40 CFR:

(a) For the purposes of this subpart, the following abbreviations shall have the following meaning: (1) kg shall mean kilogram(s); (2) kkg shall mean 1,000 kilograms; and, (3) lb shall mean pound(s).

§ 411.12 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.

The following table sets forth the quantity or quality of pollutants or properties which may be discharged after application of the best practicable control technology currently available by a point source subject to the provisions of this subpart:

Effluent characteristic	*Effluent limitation*
Total suspended nonfilterable solids.	Maximum for any 1-day period shall not exceed 0.005 kg/kkg product cement.
pH	Not to exceed 6.0 to 9.0.
Temperature	Not to exceed 3° C rise above inlet temperature.

§ 411.13 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.

The following table sets forth the quantity or quality of pollutants or properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart:

Effluent characteristic	*Effluent limitation*
Total suspended nonfilterable solids.	Maximum for any 1-day period shall not exceed 0.005 kg/kkg product cement.
pH	Not to exceed 6.0 to 9.0.
Temperature	Not to exceed 3° C rise above inlet temperature.

§ 411.14 Standards of performance for new sources.

The following table sets forth the quantity or quality of pollutants or properties which may be discharged after application of standards of performance for new sources by a point source subject to the provisions of this subpart:

Effluent characteristic	*Effluent limitation*
Total suspended nonfilterable solids.	Maximum for any 1-day period shall not exceed 0.005 kg/kkg product cement.
pH	Not to exceed 6.0 to 9.0.
Temperature	Not to exceed 3° C rise above inlet temperature.

§ 411.15 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act for a source within the nonleaching subcategory of sources as defined in § 411.10 of this subpart A (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standards set forth in Part 128, 40 CFR, except that for the purposes of this section, § 128.133, 40 CFR, shall be amended to read as follows: "In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 411.14: *Provided*, That if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

Subpart B—Leaching Subcategory

§ 411.20 Applicability; description of leaching subcategory.

The provisions of this subpart are applicable to discharges resulting from the process in which several mineral ingredients (limestone or other natural sources of calcium carbonate, silica, alumina, and iron together with gypsum) are used in the manufacturing of cement and in which kiln dust is contacted with water as an integral part of the process or water is used in wet scrubbers to control kiln stack emissions.

§ 411.21 Specialized definitions.

For the purpose of this subpart: The following definitions apply in addition to, or instead of, the general definitions set forth in Part 401, 40 CFR:

(a) For the purposes of this subpart, the following abbreviations shall have the following meaning: (1) kg shall mean kilogram(s); (2) kkg shall mean 1,000 kilograms; and, (3) lb shall mean pound(s).

§ 411.22 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.

The following table sets forth the quantity or quality of pollutants or properties which may be discharged after application of the best practicable control technology currently available by a point source subject to the provisions of this subpart:

Effluent characteristic	*Effluent limitation*
Total suspended nonfilterable solids.	Maximum for any 1-day period shall not exceed 0.15 kg/kkg (0.30 lb/ton) of dust leached.
pH	Not to exceed 6.0 to 9.0.
Temperature	Not to exceed 3° C rise above inlet temperature.

§ 411.23 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.

The following table sets forth the quantity or quality of pollutants or properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart:

Effluent characteristic	*Effluent limitation*
Total suspended nonfilterable solids.	Maximum for any one-day period shall not exceed 0.005 kg/kkg (0.01 lb/ton) product cement.
Total dissolved solids.	Maximum for any one-day period shall not exceed 0.005 kg/kkg (0.01 lb/ton) of product cement.
pH	Not to exceed 6.0 to 9.0.
Temperature	Not to exceed 3° C rise above inlet temperature.

§ 411.24 Standards of performance for new sources.

The following table sets forth the quantity or quality of pollutant effluent characteristics or properties which may be discharged after application of the standards of performance for new sources subject to the provisions of this subpart:

Effluent characteristic	*Effluent limitation*
Total suspended nonfilterable solids.	Maximum for any one-day period shall not exceed 0.15 kg/kkg (0.30 lb/ton) of dust leached.
pH	Not to exceed 6.0 to 9.0.
Temperature	Not to exceed 3° C rise above inlet temperature.

§ 411.25 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act for a source within the cement manufacturing industry leaching subcategory of sources as defined in § 411.20 (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standards set forth in Part 128, 40 CFR, except that for the purposes of this section, § 128.133, 40 CFR shall be amended to read as follows: "In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 411.12: *Provided*, That if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

[FR Doc.73-18868 Filed 9-6-73;8:45 am]

[40 CFR Part 412]

FEEDLOTS CATEGORY

Effluent Limitations Guidelines for Existing Sources and Standards of Performance and Pretreatment Standards for New Sources

Notice is hereby given that effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources set forth in tentative form below are proposed by the Environmental Protection Agency ("EPA") for the feedlots category of point sources pursuant to sections 301, 304(b) and (c), 306(b) and 307(c) of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, 1311, 1314(b) and (c) and 1316, 1316(b) and 1317(c), 86 Stat. 816 et seq.) (the "Act").

(a) Legal authority:

(1) Existing point sources;

Section 301(b) of the Act requires the achievement by not later than July 1, 1977, of effluent limitations for point sources, other than publicly owned treatment works, which require the application of the best practicable control technology currently available as defined by the Administrator pursuant to section 304(b) of the Act. Section 301(b) also requires the achievement by not later than July 1, 1983, of effluent limitations for point sources other than publicly owned treatment works, which require the application of best available technology economically achievable which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 304(b) to the Act. Section 304(b) of the Act requires the Administrator to publish, within one year of enactment of the Act, regulations providing guidelines for effluent limitations setting forth the degree of effluent reduction attainable through the application of the best practicable control technology currently available and the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods and other alternatives.

(2) New sources:

Section 306 of the Act requires the achievement by new sources of a Federal standard of performance providing for the control of the discharge of pollutants which reflects the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

Section 306(b)(1)(B) of the Act requires the Administrator to publish a list of categories of sources within 90 days after the date of enactment of the Act (October 18, 1972). Within one year after a category of sources is included on the list, the Administrator is required to propose regulations establishing Federal standards of performance for new sources within such category. The Administrator published in the FEDERAL REGISTER of January 16, 1973, (38 FR 1624) a list of 27 source categories, including the feedlots source category. The regulations proposed herein set forth the standards of performance applicable to new sources within the feedlots source category.

Section 307(c) of the Act requires the Administrator to promulgate pretreatment standards for new sources at the same time that standards of performance for new sources are promulgated pursuant to section 306. Sections 412.15 and 412.25 proposed below provide pretreatment standards for new sources within the feedlots category.

Section 304(c) of the Act requires the Administrator to issue to the States and appropriate water pollution control agencies information on the processes, procedures or operating methods which result in the elimination or reduction of the discharge of pollutants to implement standards of performance under section 306 of the Act. The Development Document referred to below provides, pursuant to section 304(c) of the Act, preliminary information on such processes, procedures or operating methods.

(b) Summary and basis of proposed effluent limitations guidelines and standards of performance.

(1) General methodology:

The effluent limitations guidelines and standards of performance proposed herein were developed in the following manner. The point source category was first studied for the purpose of determining whether separate limitations and standards are appropriate for different segments within the category. This analysis included a determination of whether differences in raw material used, product produced, manufacturing process employed, age, size, waste water constituents and other factors require development of separate limitations and standards for different segments of the point source category. The raw waste characteristics for each such segment were then identified. This included an analysis of: (1) source, flow and volume of water used in the process employed and the sources of waste and waste waters in the operation; and (2) the constituents (including thermal) of all waste waters, including the toxic constituents and other constituents which result in taste, odor and color in the water or aquatic organisms. The constituents of the waste waters which should be subject to effluent limitations guidelines and standards of performance were identified.

The full range of control and treatment technologies existing with each segment was identified. This included an identification of each distinct control technology, including both inplant and end-of-process technologies which are existent or capable of being designed for each segment. Also included was an identification of, in terms of the amount of constituents (including thermal) and the chemical, physical, biological characteristics of pollutants, the effluent level resulting from the application of each of the treatment and control technologies. The problems, limitations and reliability of each treatment and control technology and the required implementation time was also identified. In addition, the nonwater quality environmen-

tal impact, such as the effects of the application of such technologies upon other pollution problems, including air, solid waste, noise and radiation were also identified. The energy requirements of each control and treatment technology as well as the cost of the application of such technologies were identified.

The information, as outlined above, was then evaluated in order to determine what levels of technology constitute the "best practicable control technology currently available," "best available technology economically achievable" and the "best available demonstrated control technology, processes, operating methods, or other alternatives." In identifying such technologies, various factors were considered. These included the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, nonwater quality environmental impact (including energy requirements) and other factors.

The data on which the above analysis was performed was derived from consultant reports, site inspections, published and unpublished technical literature, State pollution control agencies and industry submissions.

The pretreatment standards proposed herein are intended to be complementary to the pretreatment standards proposed for existing sources under Part 128 of 40 CFR. The basis for such standards is set forth in the FEDERAL REGISTER of July 19, 1973, 38 FR 19236. The provisions of Part 128 are equally applicable to sources which would constitute "new sources," under section 306 if they were to discharge pollutants directly to navigable waters, except for § 128.133. That section provides a pretreatment standard for "incompatible pollutants" which requires the application of the "best practicable control technology currently available," subject to an adjustment for amounts of pollutants removed by the publicly owned treatment works. Since the pretreatment standards proposed herein apply to new sources, §§ 412.15 and 412.25 below amend § 128.133 to require application of the standard of performance for new sources rather than the "best practicable" standard applicable to existing sources under sections 301 and 304(b) of the Act.

(2) Summary of conclusions with respect to feedlots source category:

As differentiated from pasture or rangeland conditions, feedlots are concentrated, confined animal or poultry growing operations for meat, milk or egg production or stabling in pens or houses wherein the animals or poultry are fed at the place of confinement, and crop production is not sustained in the area of confinement. The feedlots industry was segmented into eighteen subcategories based upon animal type, production systems and waste characteristics. These subcategories are: open lot, beef cattle; totally housed lot, beef cattle; stall barn, dairy; free stall barn, dairy; cowyard, dairy; open dirt or "pasture" lot swine; totally housed slotted floor lot, swine; solid concrete pad, open or housed, swine; open lot, sheep; housed lot; stables for horses; broiler chickens; layer chickens (egg production); layer breeding and replacement; open lot, turkeys; housed lot, turkeys; dry lot ducks; wet lot ducks. Definition of the terms used in identifying these subcategories are given in §§ 412.11 and 412.21 below. Factors such as age, size of plant, process employed, and waste control technologies further substantiated subcategorization of the feedlots industry in this manner for the purpose of the application of effluent limitations guidelines and standards of performance.

The pollutants contained in raw waste waters or runoff resulting from all confined animal or poultry production processes are principally biochemical oxygen demand, chemical oxygen demand, dissolved solids, suspended solids, nitrates and ammonia, phosphorus and coliform bacteria. Except in the most general terms, feedlot operations do not conform to other water-using manufacturing industries. Water flows are related to rainfall, process water use (manure flushing or washing), or a combination of the two. Process waste flows relate to either the water flow system or to purely bulk solids (raw or partially degraded manure) handling systems. Methods for managing water or waste bows are normally predicated upon a number of factors such as the specific site location, animal type, production system, soil, crop, and cultural practices for the region. Among the alternatives available for managing waste flows are holding basins, ponds, or lagoons to capture and partially stabilize wastes, anaerobic-lagoon systems, modified activated sludge concepts and oxidation ditches for refined handling and partial treatment of wastes and land utilization by irrigation, bulk liquid spreading, or bulk solids spreading, to complete the waste management cycle.

The more refined concepts are municipal secondary treatment methods which are sometimes useful for simplifying waste handling and disposal (e.g. oxidation ditch in a housed slotted floor swine operation). However, because of the extremely concentrated nature of the wastes, even the secondary treated effluents are of very poor quality (ten to twenty times more concentrated than raw domestic waste). Land utilization for liquid wastes or impoundment storage/evaporation with periodic solids disposal are still required and practicable. This effectively eliminates direct discharges. In duck production, however, because of water-based growing systems and limited land availability, biological treatment with subsequent discharge of effluents is of necessity most practicable. The effluents from duck production are known to contain the general organic and nutrient pollutant parameters noted above although the data are limited on all parameters except BOD and coliform bacteria. The biological treatment systems used in the industry to accomplish efficient removal of BOD and coliform bacteria also substantially reduce the other pollutants (suspended solids, nitrogen, etc.).

For all animal types, waste management is closely interrelated with both pollution control and animal husbandry. The costs of any given type of waste management method were not found to be excessive and often directly related to animal production costs as opposed to pollution control costs. Costs for runoff control, for example, will generally range between $2 and $12 per head of beef cattle (or equivalent in raw waste load for other species). Part of these costs (e.g., for manure collection, pen cleaning, etc.) are related to animal health and sanitation requirements as operating expenses and do not affect pollution control investments. Considerably more refined technologies were also investigated and include methods to process manure for refeeding or other by-product recovery. Such concepts as dehydration, anaerobic digestion, and microbial fermentation have been tested and there is reasonable confidence that the methods will be useful in the future. In nearly all cases, the intent is to preserve or enhance protein (feed) value which may offset feeding costs and lead to further economic benefits through resource recovery as well as pollution control. Other than the explicit requirement for land utilization for waste management, nonwater quality environmental impacts due to these technologies are minimal. Air pollution (odor) problems are inherent in the operations and can be minimized by good housekeeping, sanitizing chemicals or judicious site selection. Technology regarding solid wastes and noncontaminating land disposal is embodied in the efficient practices used throughout the industry. Net energy requirements for waste control have no significant impact and are very small (estimated to be less than 5.0 percent of total requirements) in relation to production needs.

Except for the duck production subcategories, the feedlot industry is successfully practicing storage/land disposal of process wastes and waste water at a significant portion of operations. It is therefore concluded that the effluent limitation representing the degree of effluent reduction obtainable through the application of the best practicable control technology currently available is no discharge of waste water pollutants to navigable waters subject to exception in the event of excess rainfall, floods, or similar occurrences. The duck growing industry is successfully practicing secondary treatment of waste waters using aerobic or aerated biological treatment with chlorination, at a significant number of operations. Therefore, the effluent limitation representing the average of the best of these treatment facilities can achieve an effluent containing only 2.0 pounds of BOD–5 per 1000 ducks being fed for any 30 consecutive day period and greatly reduced bacterial (coliform) con-

tent. Therefore, the degree of effluent reduction obtainable through the application of best practicable control technology currently available is 2.0 pounds of BOD–5 per 1000 ducks fed and a fecal coliform limit of 400 counts per 100 ml at any time. By using complete confinement dry lot buildings with no outside duck runs, waste collection and treatment, recycle of treated wastes for raw waste flushing or irrigation, the duck production subcategories may eliminate the discharge of pollutants to navigable waters. This concept is already being practiced commercially by one operation in the industry with an apparent improvement in production efficiency. It is therefore concluded that the effluent limitation representing the degree of effluent reduction obtainable through the application of the best available technology economically achievable is no discharge of process wastewater pollutants. As an adjunct to these technical findings, an economic impact analysis was conducted. This analysis revealed that no impact exists upon those operations at least as large as stipulated in 40 CFR, Parts 124 and 125. Within the animal types of beef cattle, dairy cattle, swine, and ducks an impact is expected as increases in investment in pollution control facilities are required. As a result, structural changes already projected for the industry (increases in capacity for larger facilities with coincident decrease in small operations) may be substantiated by imposing these effluent limitations. However, effects upon product price increases or employment were found to be quite small, while overall production is likely to increase.

A report entitled "Development Document for Effluent Limitations Guidelines and Standards of Performance for the Feedlots Point Source Category" which further describes the technical analysis undertaken in support of the regulations being proposed herein is available for inspection at all EPA regional offices, State water pollution control offices, and is available from the EPA Information Center, Room 227, West Tower, Waterside Mall, in Washington, D.C., at all EPA regional offices, and at State water pollution offices. A supplementary analysis of the possible economic effect of the proposed regulations is also available for inspection at these locations. Copies of both of these documents are being sent to persons or institutions affected by the proposed regulations, or who have placed themselves on a mailing list for this purpose (see EPA's Advance Notice of Public Review Procedures, 38 FR 21202, August 6, 1973). An additional limited number of copies of both reports are available. Persons wishing to obtain a copy may write the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Philip B. Wisman.

(c) Summary of public participation:

Prior to this publication, the agencies and groups listed below were consulted and given an opportunity to participate in the development of the effluent limitations guidelines and standards of performance for the feedlots industry. The Development Document referred to above includes as a supplement a detailed description of consultations and other participation by the public which has taken place in the course of development of these proposed regulations. The following are the principal agencies and groups consulted: Effluent Standards and Water Quality Information Advisory Committee (established under section 515 of the Act); all State and U.S. Territory Pollution Control Agencies; American National Cattlemen's Association; National Livestock Feeders Association; National Pork Producers Council; National Milk Producers Federation; National Lamb Feeders Association; National Broiler Council; American Turkey Growers Association; Poultry and Egg Institute of America; Long Island Duck Growers Cooperative; American Society of Mechanical Engineers; American Society of Civil Engineers; Hudson River Sloop Restoration, Inc.; the Conservation Foundation; Environmental Defense Fund, Inc.; National Wildlife Federation; National Resources Defense Council; Council on Agricultural Science and Technology; Water Pollution Control Federation; Department of Agriculture; Department of Commerce; Department of Health, Education and Welfare; Department of the Interior; and the Water Resources Council.

The primary issues raised in the comments about previous drafts of these proposed effluent limitations guidelines and standards of performance and the discussion of these issues herein are as follows:

The earlier drafts did not offer limitations which accounted for excessive rainfall circumstances. Water pollution from the feedlot industry is almost wholly predicated upon the occurrence of a rainfall event which causes surface runoff of manure. The other potential source is from discharges due either to the washdown or flushing of wastes from pens, barns or other feedlot facilities or overflows from continuous flow watering systems. Since the effect of rainfall runoff is generally much greater than these other sources of discharge, it is the control of runoff thereof which must provide the baseline for effluent limitations. The key issue is the definition of the degree to which runoff must be controlled. In order to avoid requiring excessive land areas to be set aside to account for runoff from rare rainfall events, limitations must be set for some maximum feasible storage requirement. It was determined that the 10 year, 24 hour storm or equivalent hydrologic event(s) would serve the purposes of the Act as a basis for limitations based on best practicable control technology currently available. Similarly, refinement of control systems to contain the runoff from the 25 year, 24 hour storm or equivalent hydrologic event(s) would meet requirements of the Act as a basis for both best available technology economically achievable, and best available demonstrated technology, processes and alternatives.

A second issue was addressed by some states and public interest groups which questioned a standard for duck growers which permits a discharge of treated effluents for 1977. It is not economically feasible to recycle or reuse treated effluents in all operations at the present. Therefore, EPA has concluded that duck growers should be excluded from no discharge requirements until 1983 by which time water minimization concepts and improved growing facilities can be implemented. Moreover, the average circumstances of the best treatment systems now used by duck growers will achieve a significant reduction of pollutants when implemented by all operations in meeting the requirements of best practicable control technology currently available.

Interested persons may participate in this rulemaking by submitting written comments in triplicate to the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460. Attention Mr. Philip B. Wisman. Comments on all aspects of the proposed regulations are solicited. All comments received on or before October 9, 1973, will be considered, and will be available for public inspection during normal working hours at the Office of Public Affairs.

Dated August 31, 1973.

JOHN QUARLES,
Acting Administrator.

PART 412—EFFLUENT LIMITATIONS GUIDELINES FOR EXISTING SOURCES AND STANDARDS OF PERFORMANCE AND PRETREATMENT STANDARDS FOR NEW SOURCES FOR THE FEEDLOTS POINT SOURCE CATEGORY

Subpart A—All Subcategories Except Ducks

Sec.

412.10 Applicability; description of all subcategories except ducks.
412.11 Special definitions.
412.12 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.
412.13 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.
412.14 Standards of performance for new sources.
412.15 Pretreatment standards for new sources.

Subpart B—Ducks

412.20 Applicability; description of duck subcategory.
412.21 Special definitions.
412.22 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.
412.23 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.
412.24 Standards of performance for new sources.
412.25 Pretreatment standards for new sources.

Subpart A—All Subcategories Except Ducks

§ 412.10 Applicability; description of all subcategories except ducks.

The provisions of this subpart are applicable to discharges resulting from feedlots in the following subcategories: beef cattle—open lots; beef cattle—housed lots; dairy cattle—stall barn (with milk room); dairy—free stall barn (with milking center); dairy—cowyards (with milking center); swine-dirt or pasture lots; swine—housed, slotted floor; swine—solid concrete floor, open or housed lot; sheep—open lots; sheep—housed lots; horses—stables (race tracks); chickens—broilers, housed; chickens—layers (egg production), housed; chickens—layer breeding or replacement stock, housed; turkeys—open lots; turkeys—housed.

§ 412.11 Special definitions.

For the purposes of this subpart:

(a) The term "feedlot" shall mean a concentrated, confined animal or poultry growing operation for meat, milk or egg production, or stabling, in pens or houses wherein the animals or poultry are fed at the place of confinement and crop production is not sustained in the area of confinement.

(b) The term "process waste water" shall mean any water from any source which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g. milk, eggs).

(c) The term "process waste water pollutants" shall mean pollutants contained in process waste waters.

(d) The term "open lot" shall mean pens or similar confinement areas with dirt, or concrete surfaces wherein animals or poultry are substantially or entirely exposed to the outside environment except for possible small portions affording some protection by windbreaks, small shed-type shade areas. For the purposes hereof the term "open lot" is synonymous with the terms "cowyard" (dairy cattle), "pasture lot" (swine), and "dirt lot" (swine, sheep or turkeys), which are terms widely used in the industry.

(e) The term "housed lot" shall mean totally roofed buildings which may be open or completely enclosed on the sides wherein animals or poultry are housed over solid concrete or dirt floors, slotted (partially open) floors over pits or manure collection areas in pens, stalls or cages, with or without bedding materials and mechanical ventilation. For the purposes hereof, the term "housed lot" is synonymous with the terms "slotted floor" buildings (swine, beef), "barn" or "stable" (dairy cattle, horses), "houses" (turkeys, chickens), which are terms widely used in the industry.

(f) The terms "stall" barn and "free stall" barn shall mean specialized facilities wherein (1) producing cows and replacement cows are milked and fed in a fixed location (stall barn), or (2) producing cows are permitted free movement between resting and feeding areas (free stall barn).

(g) The term "milkroom" shall mean milk storage and cooling rooms normally used for stall barn dairies.

(h) The term "milking center" shall mean a separate milking area with storage and cooling facilities adjacent to a free stall barn or cowyard dairy operation.

§ 412.12 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.

(a) The effluent limitation representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available is no discharge of process waste water pollutants to navigable waters, except for runoff which is not contained by facilities, designed, constructed, and operated to contain all process waste water in addition to the runoff from the 10 year, 24 hour rainfall event as established by the U.S. Weather Bureau for the region in which the point source discharger is located.

(b) Application of the factors listed in section 304(b) does not require variation from the effluent limitation set forth in this section for any point source subject to such effluent limitation.

§ 412.13 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.

(a) The effluent limitation representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable is no discharge of process waste water pollutants to navigable waters, except for runoff which is not contained by facilities designed, constructed, and operated to contain all process waste water in addition to the 25 year, 24 hour rainfall event as established by the U.S. Weather Bureau for the region in which the point source discharger is located.

(b) Application of the factors listed in section 304(b) does not require variation from the effluent limitation set forth in this section for any point source subject to such effluent limitation.

§ 412.14 Standards of performance for new sources.

(a) The standard of performance representing the degree of effluent reduction obtainable by the application of the best available demonstrated control technology, processes, operating method, or other alternatives is no discharge of process waste water pollutants to navigable waters except for runoff which is not contained by facilities designed, constructed, and operated to contain all process waste water in addition to the runoff from the 25 year, 24 hour rainfall event as established by the U.S. Weather Bureau for the region in which the point source discharger is located.

(b) Application of the factors listed in section 306 does not require variation from the standard of performance set forth in this section for any point source subject to such standard of performance.

§ 412.15 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the subcategories covered in this subpart which are industrial users of a publicly owned treatment works, (and which would be new sources subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128, 40 CFR, except that for the purposes of this section, § 128.133, 40 CFR shall be amended to read as follows: "In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new source specified in § 412.14, 40 CFR, Part 412, provided that, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

Subpart B—Ducks Subcategory

§ 412.20 Applicability; description of duck subcategory.

The provisions of this subpart are applicable to discharges from feedlots for the following subcategories:

(a) Ducks—dry lot.

(b) Ducks—wet lot.

§ 412.21 Special definitions.

For the purposes of this subpart:

(a) The term "feedlot" shall mean a concentrated, confined animal or poultry growing operation for meat, milk or egg production, or stabling, in pens or houses wherein the animals or poultry are fed at the place of confinement and crop production is not sustained in the area of confinement.

(b) The term "process waste water" shall mean any water from any source which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g. milk, eggs).

(c) The term "process waste water pollutants" shall mean pollutants contained in process waste waters.

(d) The term "dry lot" shall mean a totally housed facility for growing ducks in confinement with a dry litter floor cover and expected drinking water use of up to 4.0 gallons of water per duck per day.

(e) The term "wet lot" shall mean a confinement facility for raising ducks which is open to the environment with a small portion of shelter area, and with

open water runs and swimming areas to which ducks have free access with water use in excess of 4.0 gallons per duck per day.

(f) For the purposes of this subpart, the following abbreviations shall have the following meaning: (1) kg shall mean kilogram(s); and (2) lb shall mean pounds.

§ 412.22 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available.

(a) The effluent limitation representing the degree of effluent reduction obtainable by the application of the best practicable control technology currently available is as follows:

Effluent characteristic	*Effluent Limitation*
BOD5	Maximum for any one day 1.66 kg (3.66 lb) per 1,000 ducks. Maximum average of daily values for any period of 30 consecutive days 0.91 kg (2.00 lb) per 1,000 ducks.
Fecal coliform	Maximum at any time 400 counts per 100 ml.

(b) Application of the factors listed in section 304(b) does not require variation from the effluent limitation set forth in this section for any point source subject to such effluent limitation.

§ 412.23 Effluent limitations guidelines representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable.

(a) The effluent limitation representing the degree of effluent reduction obtainable by the application of the best available technology economically achievable is no discharge of process waste water pollutants to navigable waters, except for runoff which is not contained by facilities designed, constructed, and operated to contain all process waste water in addition to the runoff from the 25 year, 24 hour rainfall event as established by the U.S. Weather Bureau for the region in which the point source discharger is located.

(b) Application of the factors listed in section 304(b) does not require variation from the effluent limitation set forth in this section for any point source subject to such effluent limitation.

§ 412.24 Standards of performance for new sources.

(a) The standard of performance representing the degree of effluent reduction obtainable by the application of the best available demonstrated control technology, processes, operating methods, or other alternatives is no discharge of process waste water pollutants to navigable waters, except for runoff which is not contained by facilities designed, constructed, and operated to contain all process waste water in addition to the runoff from the 25 year, 24 hour rainfall event as established by the U.S. Weather Bureau for the region in which the point source discharger is located.

(b) Application of the factors listed in section 306 does not require variation from the standard of performance set forth in this section for any point source subject to such standard of performance.

§ 412.25 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the subcategories covered in this subpart which are industrial users of a publicly owned treatment works (and which would be new sources subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128, 40 CFR, except that for the purposes of this section, § 128.133, 40 CFR shall be amended to read as follows: "In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 412.14, 40 CFR, Part 412; provided that, if the publicly owned treatment works which receives the pollutants is committed in its NPDES permit to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

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[40 CFR Part 422]

PHOSPHATE MANUFACTURING POINT SOURCE CATEGORY

Effluent Limitations Guidelines for Existing Sources and Standards of Performance and Pretreatment Standards for New Sources

Notice is hereby given that effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources set forth in tentative form below are proposed by the Environmental Protection Agency (EPA) for the phosphorus production subcategory (Subpart A), the phosphorus consuming subcategory (Subpart B), and the phosphate subcategory (Subpart C), of the phosphate manufacturing category of point sources pursuant to sections 301, 304(b) and (c), 306(b) and 307(c) of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316 (b) and 1317(c); 86 Stat. 816 et seq.; P.L. 92-500) (the "Act").

(a) Legal authority.

(1) *Existing point sources.*—Section 301(b) of the Act requires the achievement by not later than July 1, 1977, of effluent limitations for point sources, other than publicly owned treatment works, which require the application of the best practicable control technology currently available as defined by the Administrator pursuant to Section 304(b) of the Act. Section 301(b) also requires the achievement by not later than July 1, 1983, of effluent limitations for point sources, other than publicly owned treatment works, which require the application of best available technology economically achievable which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 304(b) to the Act.

Section 304(b) of the Act requires the Administrator to publish regulations providing guidelines for effluent limitations setting forth the degree of effluent reduction attainable through the application of the best practible control technology currently available and the degree of effluent reduction attainable through the application of the best control measures and practices achievable including treatment techniques, process and procedure innovations, operating methods and other alternatives. The regulations proposed herein set forth effluent limitations guidelines, pursuant to section 304(b) of the Act, for the phosphorus production subcategory (Subpart A), the phosphorus consuming subcategory (Subpart B), and the phosphate subcategory (Subpart S), of the phosphate manufacturing category.

(2) *New sources.*—Section 306 of the Act requires the achievement by new sources of a Federal standard of performance providing for the control of the discharge of pollutants which reflects the greatest degree of effluent reduction which the Administrator determines to be achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants.

Section 306(b)(1)(B) of the Act requires the Administrator to propose regulations establishing Federal standards of performance for categories of new sources included in a list published pursuant to section 306(b)(1)(A) of the Act. The Administrator published in the FEDERAL REGISTER of January 16, 1973 (38 FR 1624) a list of 27 source categories, including the phosphate manufacturing category. The regulations proposed herein set forth the standards of performance applicable to new sources for the phosphorus production subcategory (Subpart A), the phosphorus consuming subcategory (Subpart B), and the phosphate subcategory (Subpart C), of the phosphate manufacturing category.

Section 307(c) of the Act requires the Administrator to promulgate pretreatment standards for new sources at the same time that standards of performance for new sources are promulgated pursuant to section 306. §§ 422.15, 422.25, and 422.35, proposed below, provide pretreatment standards for new sources within the phosphorus production subcategory (Subpart A), the phosphorus consuming subcategory (Subpart B), and the phosphate subcategory (Subpart

C), of the phosphate manufacturing category.

Section 304(c) of the Act requires the Administrator to issue to the States and appropriate water pollution control agencies information on the processes, procedures or operating methods which result in the elimination or reduction of the discharge of pollutants to implement standards of performance under section 306 of the Act. The report or Development Document referred to below provides, pursuant to section 304(c) of the Act, information on such processes, procedures or operating methods.

(b) Summary and basis of proposed effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources.

(1) *General methodology.*—The effluent limitations guidelines and standards of performance proposed herein were developed in the following manner. The point source category was first studied for the purpose of determining whether separate limitations and standards are appropriate for different segments within the category. This analysis included a determination of whether differences in raw material used, product produced, manufacturing process employed, age, size, waste water constituents and other factors require development of separate limitations and standards for different segments of the point source category. The raw waste characteristics for each such segment were then identified. This included an analysis of (1) the source, flow and volume of water used in the process employed and the sources of waste and waste waters in the operation; and (2) the constituents of all waste water. The constituents of the waste waters which should be subject to effluent limitations guidelines and standards of performance were identified.

The control and treatment technologies existing within each segment were identified. This included an identification of each distinct control and treatment technology, including both in-plant and end-of-process technologies, which are existent or capable of being designed for each segment. It also included an identification of, in terms of the amount of constituents and the chemical, physical, and biological characteristics of pollutants, the effluent level resulting from the application of each of the technologies. The problems, limitations and reliability of each treatment and control technology were also identified. In addition, the non-water quality environmental impact, such as the effects of the application of such technologies upon other pollution problems, including air, solid waste, noise and radiation were identified. The energy requirements of each control and treatment technology were determined as well as the cost of the application of such technologies.

The information, as outlined above, was then evaluated in order to determine what levels of technology constitute the "best practicable control technology currently available," "best available technology economically achievable" and the "best available demonstrated control technology, processes, operating methods, or other alternatives." In identifying such technologies, various factors were considered. These included the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application, the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements) and other factors.

The data upon which the above analysis was performed included EPA permit applications, EPA sampling and inspections, consultant reports, and industry submissions.

The pretreatment standards proposed herein are intended to be complementary to the pretreatment standards proposed for existing sources under Part 128 of 40 CFR. The bases for such standards are set forth in the FEDERAL REGISTER of July 19, 1973, 38 FR 19236. The provisions of Part 128 are equally applicable to sources which would constitute "new sources," under section 306 if they were to discharge pollutants directly to navigable waters, except for § 128.133. That section provides a pretreatment standard for "incompatible pollutants" which requires application of the "best practicable control technology currently available," subject to an adjustment for amounts of pollutants removed by the publicly owned treatment works. Since the pretreatment standards proposed herein apply to new sources, §§ 422.15, 422.25 and 422.35 below amend §128.133 to require application of the standard of performance for new sources rather than the "best practicable" standard applicable to existing sources under sections 301 and 304(b) of the Act.

(2) Summary of conclusions with respect to the phosphorus production subcategory (Subpart A), the phosphorus consuming subcategory (Subpart B), and the phosphate subcategory (Subpart C), of the phosphate manufacturing category of point sources.

(i) Categorization.

For the purpose of studying waste treatment and effluent limitations, the phosphate manufacturing category was divided into three discrete subcategories which coincide with a breakdown of the category according to the flow of materials as outlined in the Development Document for the phosphate manufacturing category.

(1) *Subpart A.*—Phosphorus Production Subcategory: Phosphorus (and byproduct ferrophosphorus) production stands by itself as a smelting operation, as opposed to more conventional chemical processes. In phosphorus production, a grossly impure raw material is involved, and raw wastes and byproducts are generated which dwarf the quantities of the primary product recovered. The remainder of the industry starts with relatively pure materials, and waste streams are consequently much smaller.

(2) *Subpart B.*—Phosphorus Consuming Subcategory: The chemicals that are made directly from elemental phosphorus (dry process phosphoric acid, phosphorus pentoxide, phosphorus pentasulfide and phosphorus trichloride) may be grouped together because aqueous wastes arise primarily from sources other than the direct process stream. Air pollution abatement unit operations, product purification residues, tail gas seals, vessel cleanings, and leaks and spills are the sources of the aqueous waste streams. Phosphorus oxychloride has been added despite the fact that phosphorus is not a direct raw material of its production; however, the waste streams have similar origins.

(3) *Subpart C.*—Phosphate Subcategory: The chemicals that are made from phosphoric acid include sodium tripolyphosphate and the calcium phosphates. The calcium phosphates include both the animal or livestock feed grade and the human food grade products. These constitute a separate segment because large volumes of process water is used in their manufacture, and also because they are finely divided solid products. The former characteristic gives rise to some aqueous wastes of direct process origin; the latter characteristic gives rise to aqueous wastes from wet dust scrubbing equipment. Most of the animal feed grade phosphate of this subcategory is not made from dry process phosphoric acid produced by industries of Subpart B, the phosphorus consuming subcategory. The livestock feed grade product is mainly produced from wet process phosphoric acid.

(ii) Waste characteristics.

The pollutants contained in raw waste waters resulting from the phosphate manufacturing category include fluoride compounds, arsenic compounds, elemental phosphorus, phosphoric acid, sulfurous acid, sulfuric acid, hydrochloric acid, suspended solids, chromates, total dissolved solids and ammonia. Large volumes of cooling water are required by the industry; heat is a raw waste water problem. Five potentially harmful components were noted in raw waste water streams at objectionable concentrations. These were elemental phosphorus, fluorine compounds, arsenic compounds, free inorganic acids and chromates. Some western ores contain considerable cadmium. This element does not normally appear in the waste water discharges of the phosphate manufacturing category, even when present in the ore at a significant level. Vanadium and radium also occur in some ores and must be considered as potential waste water components.

Noncontact cooling water, process and product water, transport water, contact cooling or heater water, atmospheric seal water, scrubber water, and auxiliary process water form the principal waste water streams in phosphate manufacturing. Raw waste load data have been collected on these streams for each subcategory of the industry, and information assembled on the treatment procedures required for each waste water stream.

(iii) Origin of waste water pollutants in the phosphate manufacturing category.

(1) Phosphorus production subcategory: An extremely large quantity of non-contact cooling water is employed. Electrostatic precipitators utilized ahead of phosphorus removal sprays collect a dust that contains about 50 percent phosphorus pentoxide, with other solids. A sludge originates in the phosphorus condenser sump. This is a mixture of dispersed phosphorus, and other solids that escaped through the stack electrostatic precipitator.

The calciner and furnace fume scrubber liquor waste components are SiO_2, Fe_2O_3, and phosphates, sulfates and fluorides as dissolved solids. The scrubber water is highly acidic from pick-up of sulfur dioxide, and acidic fluorine compounds.

The phosphorus condenser liquor is the main "phossy" water source. Phossy water, a colloidal dispersion of elemental phosphorus, is extremely harmful to aquatic organisms and a major waste water problem. Phossy water occurs from many other sources, whenever elemental phosphorus is handled. Phossy water develops in the water seals and water covers maintained over storage and shipping containers, from washing operations to purify phosphorus, and container cleaning operations.

The slag quenching liquor stream is characterized by suspended solids and dissolved solids, primarily as sulfates. The waste water contains fluorine compounds in the soluble and suspended forms.

(2) Phosphorus Consumption Subcategory: Phossy water is generated whenever elemental phosphorus is stored and shipped. The manufacturing processes are dry, except for use of some water in phosphoric acid production. Waste water pollutants primarily originate from spills, leaks into water seals, and cleanup of equipment and shipping containers.

Water scrubbers, used to pick up fumes from casting of phosphorus pentasulfide, are a source of pollution. Phosphorus trichloride and phosphorus oxychloride manufacture utilize chlorination steps. This leads to the formation of hydrochloric acid. The chlorides do not precipitate in usual treatment operations and constitute a difficult waste water problem.

(3) Phosphate Subcategory: The aqueous wastes from this segment of the industry arise from the use of wet scrubbing equipment, spray and dust deposits, clarified waste water from centrifuges, and filtrate fractions. The pollutants are largely sodium and calcium phosphates, which give rise to suspended and soluble solids in waste water.

A defluorination process utilized in feed grade phosphate production leads to formation of a large suspended solids waste water fraction.

(iv) Treatment and control technology.

In-plant procedures to control pollution include good housekeeping, control of spills, reduction and control of start-up and shut down operations, reuse of waste water, recycle of sediment to raw material supply, salvage of sediment and incorporation in the final product salvage of intermediate products for sale as byproduct, and control of runoff and seepage from lagoons.

"End-of-pipe" waste water treatment processes include sedimentation, flocculation, precipitation, filtration, neutralization, holding basins, lagoons, spray ponds, cooling towers, condensers, disposal of solids to landfill areas, continuous monitoring of cooling water, evaporation and recycle. Treatment technology from this industry requires segregation of process water and cooling water. Process water commonly reused after lime treatment and sedimentation. Phossy water is commonly treated before reuse by holding in a settling pond, neutralization with lime, treatment with a flocculation aid and then additional clarification. Total process waste water recycle is being practiced in segments of the industry.

Air pollution control processes include precipitation, filtration, demisting, stack washing, use of separator towers, cyclone separation, and diversion of components originating in air pollution control processes to waste water treatment systems, to raw materials, and to products. Wet scrubbing of stacks leads to heavy contamination of waste water.

Solid waste control must be considered. The waste water from the phosphate industry, and treatment processes of the industry develop a considerable volume of highly hydrated fluorsilicaceous and silicaceous substance. These hydrated solid wastes form relatively unstable landfill deposits. Best practicable control technology and best available control technology as they are known today, require disposal of the pollutants removed from waste waters in this industry in the form of solid wastes and liquid concentrates. In most cases these are nonhazardous substances requiring only minimal custodial care. However, some constituents may be hazardous and may require special consideration. In order to ensure long term protection of the environment from these hazardous or harmful constituents, special consideration of disposal sites must be made. All landfill sites where such hazardous wastes are disposed, should be selected so as to prevent horizontal and vertical migration of these contaminants to ground or surface waters. In cases where geologic conditions may not reasonably ensure this, adequate legal and mechanical precautions (*e.g.* impervious liners) should be taken to ensure long term protection to the environment from hazardour materials. Where appropriate, the location of solid hazardous materials disposal sites should be permanently recorded in the appropriate office of legal jurisdiction.

(v) Treatment and control technology within subcategories.

Waste water treatment and control technologies have been studied for each subcategory of the industry to determine what is (a) The best practicable control technology currently available, (b) the best available technology economically achievable, and (c) the best available demonstrated control technology, processes, operating methods or other alternatives.

(1) Treatment in phosphorous production subcategory: The best practicable control technology currently available leads to no discharge of the waste components of process waste water from plants of the phosphorus production subcategory. Large amounts of once through cooling water are utilized in the industry. It is vitally important that this be segregated from process waste water. Process waste water can be completely recycled, and reused by lime neutralization and sedimentation. The process waste water is characterized by much suspended phosphorus, silicate, sulfate, fluoride, fluorosilicate and other suspended solids. The treatment system must be protected from excessive intrusion of rain water, and be of adequate volume to handle normal intrusion of peak rainfall periods. The presence of much fine and highly hydrated solids in the waste water typically leads to rapid sealing of most soils. Adverse geologic and hydrologic factors, associated with site selection, may create an environmental uncertainty and could require consideration of adequate impervious liners on the bottoms and sides of treatment ponds to prevent seepage to ground or surface waters.

The requirements for the best available technology economically achievable and for the best available demonstrated control technology, processes, operating methods, or other alternatives for new sources are met by the requirements for the best practicable control technology currently available.

(2) Treatment in the phosphorus consuming subcategory: Best practicable control technology currently available involves segregation of cooling water from process water and treatment and recycle, and reuse of process waste water. Prevention of leaks and spills is important in phosphoric acid production, and for all other products of the subcategory. Total recycle is required for scrubber water in phosphorus pentoxide and phosphorus pentasulfide production. Phosphoric acid is a significant raw waste water contaminant. Lime precipitation is essential in some situations, along with recycle. A special problem is encountered in this subcategory for phosphorus trichloride and phosphorus oxychloride production. The chlorides derived from the chlorination step are not wholly amenable to recycle procedures. A small discharge of total dissolved solids total suspended solids occurs in recycle blowdown. Recycle with lime precipitation and filtration are required operations in phosphorus trichloride and phosphorus oxychloride production.

Condenser coolers are in extensive use in the subcategory. Refrigerated condensers are required for phosphorus trichloride and phosphorus oxychloride production to hold hydrochloric acid

contamination to a low level. Monitoring is essential to detect and correct process leaks. Contaminated cooling water must be dealt with as process waste water.

Treatment required to achieve best available technology economically achievable, and for best available demonstrated control technology, processes, operating methods or other alternatives for new sources is unchanged from best practical control technology for most products in the subcategory. However, evaporation must be considered to deal with the blowdown from the chlorinated products, phosphorus trichloride and phosphorus oxychloride.

(3) Treatment in the phosphate subcategory: Total recycle, with lime precipitation and dry dust collection, is required in the phosphate subcategory for best practicable control technology currently available. Control of spills and good housekeeping measures are necessary and the segregation of uncontaminated cooling water is essential. Continuous monitoring of condenser cooling water for leaks and provision of emergency storage, and treatment facilities are desirable.

As no discharge of process waste water pollutants to navigable waters is achieved by best practicable control technology currently available, no modifications are required to meet best available technology economically achievable, or best available demonstrated control technology, processes, operating methods, or other alternatives.

(vi) Cost estimates for control of waste water pollutants in the phosphate manufacturing category: Cost estimates follow for processes that can achieve the various levels of treatment required for the three subcategories.

(1) The phosphorus production subcategory: No discharge of process waste water pollutants for the phosphorus production subcategory is achieved through 100 percent recycle of process waste water. No discharge of process waste water pollutants to navigable waters is achieved by 10 percent of the subcategory. Complete recycle would add $4.60/ton of product to the treatment costs of the remaining 90 percent of the subcategory. This 90 percent of the subcategory now applies recycle of phossy water, and recycle of process waste water.

(2) Phosphorus consuming subcategory: No discharge of process waste water pollutants to navigable waters is achieved by 10 percent of the subcategory at an average cost increase of $0.65/ton over the remaining portion of the subcategory. This level of discharge limitation can be achieved by the phosphorus pentoxide segment at a cost of $1.40/ton of product; by the phosphorus pentasulfide segment at a cost of $1.70/ton of product; by the phosphorus trichloride segment using evaporation at a cost of $1.70/ton of product; and, by the phosphorus oxychloride segment using evaporation at a cost of $1.25/ton of product. Best practicable control technology currently available can be achieved by the phosphorus trichloride segment at a cost of $0.70/ton of product and by the phosphorus oxychloride segment at a cost of $0.85/ton of product. All costs are in relation to plants discharging untreated waste waters.

(3) Phosphate subcategory: No discharge of process waste water pollutants to navigable waters is being achieved by all of the sodium tripolyphosphate segment. No additional cost is required to maintain this status. This level of discharge control is achieved in the feed grade dicalcium phosphate segment at a cost of $1.40/ton of product over usual practices, and in the production of food grade dicalcium phosphate at a cost of $1.40/ton of product.

(vii) Establishing daily maximum limitations: The daily maximum limitation of twice the 30 day limitation for total suspended solids and for total dissolved solids in the phosphorus trichloride and phosphorus oxychloride products of the phosphorus consuming subcategory is based on statistical studies of waste generation at existent plants.

(viii) Much consideration has been given to the nonwater quality aspects of pollution control. The large quantities of highly hydrated silicates and fluorosilicates, along with other fine precipitates formed in the treatment processes create a substantial solid waste problem. Landfill and lagoon sites of adequate size and character are essential for treatment processes. The industry produces large quantities of air pollutants. These are separated by a variety of stack treatment processes. Many of the stack wastes create solid waste and waste water problems. The phosphorus production subcategory creates the major air and solids problems.

The soluble chloride salts resultant from evaporation require disposal in a site permanently protected from leaching. These chloride salts remain soluble for an infinite time period. These salts will migrate to ground water, through the inexorable leaching processes normal to soil and normal ground water movement unless extraordinary measures are taken to check the processes.

(ix) Economic impact analysis.

The economic analysis has focused on both internal and external costs associated with the proposed levels of water pollution abatement.

The total investment and annual costs required for all subcategories of this segment of the industry to achieve no discharge of process waste water pollutants to navigable waters by 1977 are estimated at $9.3 million and $4.9 million, respectively. Two segments, phosphorus oxychloride and phosphorus trichloride are not required to achieve this effluent level by 1977, however, the costs to achieve this level of control are included for comparison.

The total cost of water pollution abatement, both operating and raw material costs, for each product has been related to the average product selling price to determine the magnitude of either price increases, if these costs can be passed on, or decreases in pre-tax profitability. These percentages range from 0.6% for phosphorus pentoxide to 1.6 percent for feed-grade dicalcium phosphate.

External cost deals basically with the assessment of economic impact of the internal costs discussed above in terms of price increases, production curtailments or plant closures, resultant employment, community and regional impacts, international trade, and future industry growth. It should be noted that a precise study of economic impact is difficult due to numerous other economic forces at work within an industry, and because of the great variability experienced from plant-to-plant in such factors as pollution control costs, profitability, and return on investment. In an economic study such as this, it is not possible to deal with these factors on an individual plant basis.

It is not expected that any significant economic impact would result from imposing the requirement of no discharge of process waste water pollutants to navigable waters on all covered segments of this category by 1977 (Best Practicable Control Technology for most industry segments). Because of this conclusion, we judge that the proposed guidelines for 1977, 1983 and new sources are economically achievable. The small price increases projected will probably be fully passed on to the consuming industry, since there are few substitutable products. Although the small costs can be passed on by all segments, the sodium tripolyphosphate, and dicalcium phosphate segments would have to absorb costs of any greater magnitude due to declining sodium tripolyphosphate markets and cost-competitive alternates for dicalcium phosphates. In general, the economic viability of no plants in the industry will be threatened by the added burden of the costs. Hence, no production curtailments or plant closures are expected and therefore, there should be no resultant unemployment, community or future growth impacts. because international trading of the products of this industry is of very small significance, and projected price increases are small, the U.S. balance of trade is not expected to be affected by the proposed guidelines.

The report entitled "Development Document for Proposed Effluent Limitations Guidelines and New Source Performance Standards for the PHOSPHORUS DERIVED CHEMICALS Segment of the Phosphate Manufacturing Point Source Category" details the analysis undertaken in support of the regulations being proposed herein and is available for inspection in the EPA Information Center, Room 227, West Tower, Waterside Mall, Washington, D.C., at all EPA regional offices, and at State water pollution control offices. A supplementary analysis prepared for EPA of the possible economic effects of the proposed regulations is also available for inspection at these locations. Copies of both of these documents are being sent to persons or institutions affected by the proposed regulations, or who have placed themselves on a mailing list for this purpose (see EPA's Advance Notice of Public Review Procedures, 38 FR 21202, August

6, 1973). An additional limited number of copies of both reports are available. Persons wishing to obtain a copy may write the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Philip B. Wisman.

(c) Summary of public participation. Prior to this publication, the agencies and groups listed below were consulted and given an opportunity to participate in the development of effluent limitations guidelines and standards proposed for the phosphate manufacturing category. All participating agencies have been informed of project developments. An initial draft of the Development Document was sent to all participants and comments were solicited on that report. The following are the principal agencies and groups consulted: (1) Effluent Standards and Water Quality Information Advisory Committee (established under section 515 of the Act); (2) all State and U.S. Territory Pollution Control Agencies; (3) the Fertilizer Institute; (4) Manufacturing Chemists Association; (4) Puerto Rico Land Association; (5) Soap and Detergent Association; (6) The American Society of Mechanic Engineers; (7) Hudson River Sloop Restoration, Inc.; (8) The Conservation Foundation; (9) Environmental Defense Fund, Inc.; (10) Natural Resources Defense Council; (11) The American Society of Civil Defense Council; (12) The American Society of Civil Engineers; (13) Water Pollution Control Federation; (14) National Wildlife Federation, and (15) the Isaac Walton League of America.

The following organizations responded with comments: FMC Corporation, Monsanto Industrial Chemicals Company, State of Pennsylvania, Division of Industrial Wastes and Erosion Control, Delaware River Basin Commission, State of Florida, Department of Pollution Control, United States Department of Inof Florida, Department of Pollution Control, United States Department of Interior, Texas Water Quality Board, General Counsel of the Department of Commerce, California Water Resources Control Board, and New York State Department of Environmental Conservation.

The comments were highly variable, ranging from full approval to total rejection.

The primary issues raised in the development of the proposed effluent limitations guidelines and standards of performance and the treatment of these issues herein are as follows:

(1) A common criticism was that few or no plants are actually achieving no discharge of process waste water pollutants to navigable waters in some segments of the industry. As noted in the Development Document, a study of the industry established that this level is being achieved in almost all of these subcategories of phosphate manufacturing. For the remainder, established alternative in-plant and treatment procedures are available for application.

(2) A number of commentators took the position that the pH range, 6.0 to 10.5 originally proposed for process waste water discharges for phosphorus trichloride and phosphorus oxychloride production as the best practicable control technology currently available was too alkaline. The range was changed to pH 6.0 to 9.0.

(3) The criticism was made that lime treatment of phosphate does not eliminate a pollutant but merely substitutes one soluble component for another; actually, lime is highly efficient in removal of many pollutants. Lime treatment of these wastes converts phosphoric acid, and many acidic components from stack washing to insoluble precipitates, without introduction of additional soluble pollutants. Sulfuric acid, sulfurous acid, hydrofluoric acid, and the fluorosilicic acids are removed by lime in remarkably beneficial precipitation reactions.

(4) A number of commenters expressed the opinion that inadequate cost information had been gathered and that these studies were not applied to plants with the full range of treatment problems. The economic impact study, however, has established that cost is not a major factor limiting the attainment of the proposed regulations.

(5) Some comments expressed the opinion that the amount of rainfall at a plant site may be the determining factor in the practicability of meeting regulations requiring no discharge of waste water pollutants. Plants practicing total recycle will have no difficulty in meeting regulations in arid regions. While it may be more difficult to practice total recycle in a humid region than in a dry region, established sound procedures for lagoon design, location, and for control of rainfall run-off are among the factors that make the regulations practicable. It is evident that drainage plans must be optimized for a recycle plant in high rainfall regions. Potential spill and fallout areas requiring control must be limited, as must natural drainage into holding areas. Modified ponds, particularly deeper ponds, can provide extra capacity to carry a plant through periods of unfavorable weather. The regulations covering discharge limitations initiate control operation at dates long into the future. This feature provides manufacturers with the time period required to make the relocation moves, in-plant changes, and waste water treatment changes essential for complying with the Act.

(6) Many comments referred to cooling water, boiler blowdown waste water problems, and water supply waste water problems. These are to be dealt with later as a separate category. Any cooling water that picks up process related pollutants from leaks becomes process waste water. It is the responsibility of the plant to monitor cooling water streams for leaks, and to treat contaminated cooling water to the standards set up for process waste water discharges.

Interested persons may participate in this rulemaking by submitting written comments in triplicate to the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Philip B. Wisman. Comments on all aspects of the proposed regulations are solicited. All comments received on or before October 9, 1973, will be considered.

Dated August 31, 1973.

JOHN QUARLES,
Acting Administrator.

PART 422—EFFLUENT LIMITATIONS GUIDELINES FOR EXISTING SOURCES AND STANDARDS OF PERFORMANCE AND PRETREATMENT STANDARDS FOR NEW SOURCES FOR THE PHOSPHATE MANUFACTURING POINT SOURCE CATEGORY

Subpart A—Phosphorus Production Subcategory

Sec.

422.10 Applicability; description of phosphorus production subcategory.
422.11 Specialized definitions.
422.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
422.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
422.14 Standards of performance for new sources.
422.15 Pretreatment standards for new sources.

Subpart B—Phosphorus Consuming Subcategory

422.20 Applicability; description of phosphorus consuming subcategory.
422.21 Specialized definitions.
422.22 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
422.23 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
422.24 Standards of performance for new sources.
422.25 Pretreatment standards for new sources.

Subpart C—Phosphate Subcategory

422.30 Applicability; description of phosphate subcategory.
422.31 Specialized definitions.
422.32 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
422.33 Effluent limitations guidelines representing the degree of effluent reduction attainable by application of the best available technology economically achievable.
422.34 Standards of performance for new sources.
422.35 Pretreatment standards for new sources.

Subpart A—Phosphorus Production Subcategory

§ 422.10 Applicability; description of phosphorus production subcategory.

The provisions of this subpart are applicable to the discharges resulting from the production of phosphorus and ferrophosphorus by smelting of phosphate ore.

§ 422.11 Specialized definitions.

For the purpose of this subpart: the term "process waste water" shall mean any water which, during the manufacturing process, comes into direct contact with any raw material, intermediate product, by-product or product used in or resulting from the manufacture of phosphorus and ferrophosphorus.

§ 422.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best practicable control technology currently available by a point source subject to the provisions of this subpart: There shall be no discharge of process waste water pollutants to navigable waters.

§ 422.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart: There shall be no discharge of process waste water pollutants to navigable waters.

§ 422.14 Standards of performance for new sources.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged reflecting the greatest degree of effluent reduction achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants by a new point source subject to the provisions of this subpart: There shall be no discharge of process waste water pollutants to navigable waters.

§ 422.15 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the phosphorus production subcategory, which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128, 40 CFR, except that for the purposes of this section, § 128.133, 40 CFR, shall be amended to read as follows: "In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 422.14, 40 CFR, Part 422 provided that, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

Subpart B—Phosphorus Consuming Subcategory

§ 422.20 Applicability; description of phosphorus consuming subcategory.

The provisions of this subpart are applicable to discharges resulting from the manufacture of phosphoric acid, phosphorus pentoxide, phosphorus pentasulfide, phosphorus trichloride, and phosphorus oxychloride directly from elemental phosphorus. The production of phosphorus trichloride and phosphorus oxychloride create waste water pollutants not completely amenable to the procedures utilized for best practicable control technology currently available. The standards set for phosphorus trichloride manufacture and phosphorus oxychloride manufacture, accordingly, must differ from the rest of the subcategory at this level of treatment.

§ 422.21 Specialized definitions.

For the purpose of this subpart:

(a) the term "process waste water" shall mean any water which, during the manufacturing process, comes into direct contact with any raw material, intermediate product, by-product or product used in or resulting from the manufacture of phosphorus and ferrophosphorus.

(b) the term "TSS" shall mean total suspended nonfilterable solids.

(c) the term "TDS" shall mean total dissolved solids. The analytical value for this pollutant is the quantitative difference between the total solids and the total suspended nonfilterable solids.

(d) the term "kg/kkg" shall mean kilograms per 1,000 kilograms.

§ 422.22 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of best practicable control technology currently available by a point source subject to these provisions of this subpart:

(a) There shall be no discharge of process waste water pollutants to navigable water from the manufacture of phosphoric acid, phosphorus pentoxide, or phosphorus pentasulfide.

(b) The following limitations constitute the maximum permissible discharge for phosphorus trichloride manufacturing on the basis of productions:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any one day 1.4 kg/kkg of product (1.4 lb/1,000 lb). Maximum average of daily values for any period of thirty consecutive days 0.7 kg/kkg of product (0.7 lb/1,000 lb).
TDS	Maximum for any one day 10.0 kg/kkg of product (10.0 lb/1,000 lb). Maximum average of daily values for any period of thirty consecutive days 5.0 kg/kkg of product (5.0 lb/1,000 lb).
pH	6.0 to 9.0.

(c) The following table sets forth the maximum permissible discharge for phosphorus oxychloride on the basis of production:

Effluent characteristic	*Effluent limitation*
TSS	Maximum for any one day 0.3 kg/kkg of product (0.3 lb/1,000 lb). Maximum average of daily values for any period of thirty consecutive days 0.15 kg/kkg of product (0.15 1,000 lb).
TDS	Maximum for any one day 7.0 kg/kkg of product (7.0 lb/1,000 lb). Maximum average of daily values for any period of thirty consecutive days 3.5 kg/kkg of product (3.5 lb/1,000 lb).
pH	6.0 to 9.0.

§ 422.23 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this subpart: there shall be no discharge of process waste water pollutants to navigable waters resulting from the manufacture of phosphoric acid, phosphorus pentoxide, phosphorus pentasulfide, phosphorus trichloride or phosphorus oxychloride.

§ 422.24 Standards of performance for new sources.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged reflecting the greatest degree of effluent reduction achievable through ap-

plication of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants by a new point source subject to the provisions of this subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 422.25 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the phosphorus consuming subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128, 40 CFR, except that for the purposes of this section, § 128.133, 40 CFR shall be amended to read as follows: "In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 422.24, 40 CFR, Part 422; provided that, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

Subpart C—Phosphate Subcategory

§ 422.30 Applicability; description of phosphate subcategory.

The provisions of this subpart are applicable to discharges resulting from the manufacture of sodium tripolyphosphate and calcium phosphates from phosphoric acid.

§ 422.31 Specialized definitions.

For the purpose of this subpart: the term "process waste water" shall mean any water which, during the manufacturing process, comes into direct contact with any raw material, intermediate product, by-product or product used in or resulting from the manufacture of phosphorus and ferrophosphorus.

§ 422.32 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best practicable control technology currently available by a point source subject to the provisions of this Subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 422.33 Effluent limitations guidelines representing the degree of effluent reduction attainable by application of the best available technology economically achievable.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best available technology economically achievable by a point source subject to the provisions of this Subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 422.34 Standards of performance for new sources.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged reflecting the greatest degree of effluent reduction achievable through application of the best available demonstrated control technology, processes, operating methods, or other alternatives, including, where practicable, a standard permitting no discharge of pollutants by a new point source subject to the provisions of this Subpart: there shall be no discharge of process waste water pollutants to navigable waters.

§ 422.35 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act, for a source within the phosphate manufacturing category phosphorus consuming subcategory which is an industrial user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to navigable waters), shall be the standard set forth in Part 128, 40 CFR, except that for the purpose of this section, § 128.133, 40 CFR shall be amended to read as follows: "In addition to the prohibitions set forth in § 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works by a major contributing industry shall be the standard of performance for new sources specified in § 422.34, 40 CFR, Part 422; provided that, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall be correspondingly reduced for that pollutant."

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